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INFLUENCE OF STIMULUS EXPOSURE TIME IN THE EVALUATION OF SACCADES MEASURED WITH A NEW VISUAL ANALYZER

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INTRODUCTION

- Saccadic movements allow us to put the image of the object of interest into the fovea, changing quickly the gaze position.
- The principal characteristics of saccadic movements [1] are latency (around 200 ms [2]), average speed (up to 700 degrees/second [2]), accuracy and stability.
- Values of stimulus exposure time considered in the bibliography cover a big range (0.5-5 sec) making difficult to compare the results [3,4].

- **Purpose:** To determine the influence of stimulus time exposure into saccadic movements objectively assessed using a prototype of a new fully autonomous and automated vision analyzer (Eye and Vision Analyzer, EVA, DAVALOR, Spain), that records eye movements while the patient watches true-3D (matching accommodation and convergence demands) video game.

METHODS

- **Sample:** 18 healthy young subjects were enrolled in this study. The mean age ± standard deviation (SD) was 22.6 ± 2,00 years (range from 20 to 30).
- **Inclusion criteria:** Near Visual Acuity greater or equal to 0.00 logMAR; Spherical Ametropia ≤ ±6.00D; Astigmatism ≤-3.00D; Phoria values in near vision between 8x'-2e'. No previous history of amblyopia or strabismus, ocular pathology or history of eye surgery.

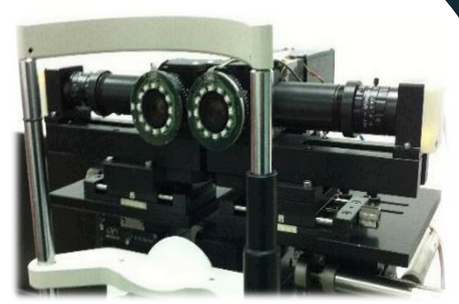
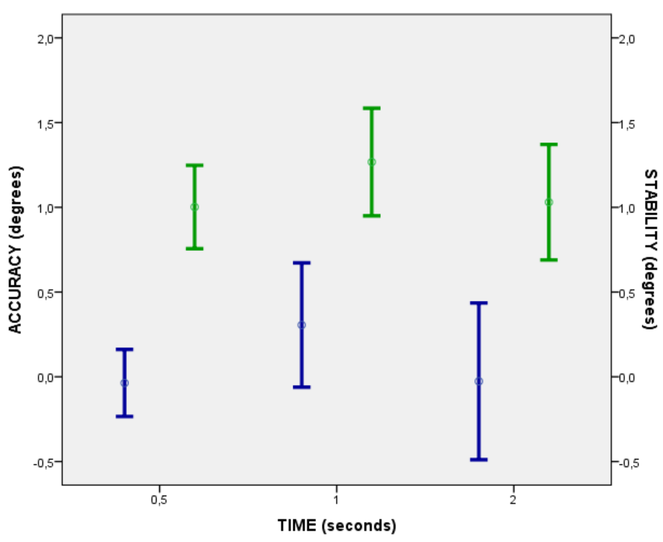


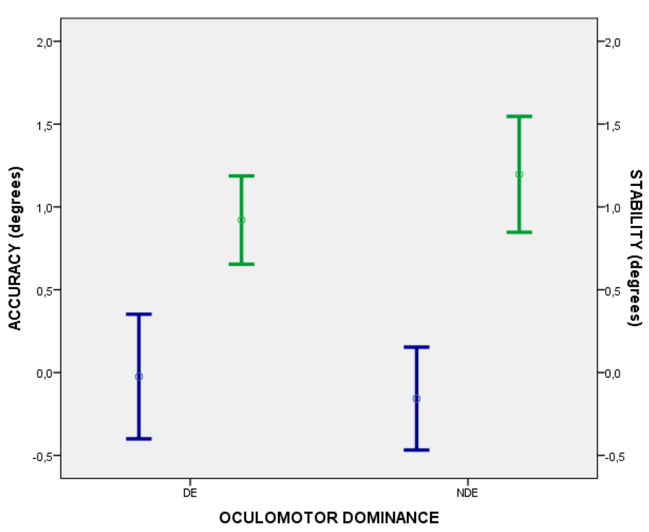
Figure 1: Prototype of EVA device

- **Ocular movements** were registered using a prototype of EVA device (Fig. 1) at a frequency of 30 Hz, showing an optotype at 40 cm with horizontal displacement. Its size corresponds to a visual acuity of 0.8 logMAR.
- **Accuracy** was assessed as the mean difference between the gaze and the stimulus positions during the fixation time without considering latency.
- **Stability** was assessed as the root mean square (RMS) of the difference between the gaze and the stimulus positions during the fixation time without considering latency.
- **Stimulus exposure time:** 0.5, 1 and 2 seconds.

RESULTS



Graphic1: Mean and 95%CI saccades accuracy (Blue line) and stability (Green line) vs stimulus time exposure.



Graphic 2: Mean and 95%CI saccades accuracy (Blue line) and stability (Green line) for dominant (DE) and non dominant (NDE) (Stimulus time exposure 1 sec)

	ACCURACY p = 0.226		STABILITY p = 0.309	
	Mean (deg)	Sd (deg)	Mean (deg)	Sd (deg)
0.5s	-0.03	0.26	1.00	0.31
1s	0.31	0.51	1.27	0.44
2s	-0.03	0.60	1.03	0.44

Table 1: Saccadic accuracy and stability (mean and standard deviation) for different stimulus time exposure (p corresponds to ANOVA significance)

	ACCURACY p = 0.539		STABILITY p = 0.167	
	Mean(deg)	Sd (deg)	Mean (deg)	Sd (deg)
DE	-0.02	0.49	0.92	0.35
NDE	-0.16	0.40	1,18	0.46

Table 2: Saccadic accuracy and stability (mean and standard deviation) for dominant (DE) and non dominant (NDE) eye (p corresponds to T-Student significance)

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CONCLUSIONS

- We did not observe statistically significant differences in accuracy and stability for different exposure times. Attentional factors could influence the accuracy and stability values obtained.
- The dominant eye has better accuracy and stability than non-dominant but the differences are not statistically significant.
- In a future work the sample will be increased.

QR Poster

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